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ABSTRACT

The purpose of this study was to determine criteria for helping students decide if they would profit more from traditional methods of instruction or from independent and individualized methods. Four areas were studied: whether traditional methods were superior to individualized methods; whether students preferred either method; whether there was a correlation of age or education levels with success in individualized study; and whether there was a correlation of autonomy, achievement, GPA, or endurance with success in individualized study. The results of several distinct tests administered to various groups of students enrolled at the Clearwater Campus of St. Petersburg Junior College in 1973-74 indicated that: (1) there was no significant difference in student learning in traditional or individualized situations; (2) there was no significant difference between student attitudes toward either mode of instruction; (3) age was not a factor in determining potential success in individualized situations, but educational level was an important factor--freshmen do not perform as well in these situations as sophomores and those holding undergraduate or graduate degrees; and (4) there was no correlation of autonomy or endurance with success in individualized study, but success did correlate with both GPA and achievement. A literature review is included. (DC)

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INDEPENDENT-INDIVIDUALIZED INSTRUCTION

WHO BENEFITS?

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For
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A Major Research Project Presented to Nova University
In Partial Fulfillment of the Requirements for the
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CHAPTER 1

INTRODUCTION

A Statement of the Purpose

This study was conducted at St. Petersburg Junior College over the academic years 1973-4 and 1974-5, using students who entered college during these time periods.

The purpose of this study was to develop criteria to help students, counselors and faculty make a judgment as to which students would or would not benefit from independent-individualized instruction.

Educators en masse are emphasizing multi-forms of independent-individualized instruction methods as an effective means of offering options to students in the community colleges. This current movement is not without problems in several areas. This study dealt with five questions the researcher perceived as problem areas. These areas were specifically related to the question, Who enters an independent-individualized instruction environment?

The researcher began using individualized instruction on a limited basis two years ago, and encountered several problems in the transitional period. Students in two sections

of Sociology, in the Fall semester of 1973, expressed a high anxiety-level when the method was introduced in the learning environment during the first week of the term. This caused serious complications. As a result, approximately twenty-five students withdrew from the courses or expressed deep discontent with the method. This intensified the problem as to what type learning environment for each student.

The researcher realized that not all students would profit from his approach to implementing these changes in instruction. Conversely, many students would be adversely affected by his approach. The Departments of Natural Sciences, Social Sciences, Humanities and English were experimenting in the use of different forms of independent-individualized instruction technologies. However, there were no criteria, standards, or guidelines to help students, administrators and counselors in the choice of learning environments. This problem, "Who benefits?" was being encountered throughout these departments with no answer available. And there was an immediate need to establish some criteria before the semester began to help students, counselors and faculty make an empirical judgment on the students' chances for success in independent-individualized instruction, and who would not benefit from this form of instruction?*

* Independent-individualized instruction is defined as any form of study where the student works on his own, at his own pace, and is assisted on a one-to-one basis by the instructional staff. (See Definition of Terms, p.)

A Statement of the Background

Independent-individualized instruction had its beginning with Pressey. Today, a long list of educators are emphasizing this 'new' approach (Roueche, Mager, Johnson and Johnson, Herrscher, Gleazer, Klaus, Crowder, et al). Silverman (1966) discusses the developments from traditional classrooms. He lists several methods including 'programmed-independent-study.' Shanberg (1971) proposes 'individualized-instruction' can help 95% of the students. Bloom (1970) proposes 90% can master the materials by this method. Brann (1973) argues for a change from the 'lockstep' of time and place for education and emphasizes this 'new' approach as part of the change.

An independent individualized approach would bring about drastic changes in time and attendance, structure and function in the college. This demand for change has been accelerated by a need for a change from a 'revolving door' to an 'open door' policy for students. The attempt has been to decelerate the loss of students and move toward a high retention rate; the problem, even though crisis in scope, cannot be solved by just changing the structure, time, and methods of teaching. There is no common agreement as to independent-individualized instruction methods being superior to traditional methods. Most educators are in agreement that change is needed

(Hilbert, 1973), and call for new patterns (Brann, 1973). The question is, What change? Moore (1968) suggests criteria for an effective self-instructional program. He cites the pro-group: Mager, 1972; Gleazer, 1964; Klaus, 1961; Walther and Crowder, 1965. Also, Silverman, Coulson, Melarango and Newmark (1964) did extensive study on objectives and criteria for self-instruction programs.

There are opponents who express their opposition in a most erudite and scholarly manner. Thatcher (1972) charges that advocates of independent study are not providing students with a continuous education, but have been taught the test. The 'new' instruction has been going on for centuries and is all right if alternate options for study are open to the student (Henderson, 1972).

The Problem

The crux of the discussion centers around the types of students and motivation (Jioia, 1973; Monte and Lifrieri, 1970). Thus, a recognition of the differences in students or who would or would not profit by one method should be ascertained. Silverman (1966) refers to active and passive students and their performances on the same material. The active benefits while the passive loses. Also, the success-fail experience

students have with programs can affect their attitudes on success or failure on future occasions (Mathis, Smith & Hansen, 1970). This study analyzed programs and concluded the low quality of programs was more detrimental to students' success than differences in students participating in self-instructional environments. The question: Are students ready for independent-individualized instruction? (Jioia, 1973). This study involved 765 students. They chose 50%-50% or were equally divided in individualized instruction versus traditional methods. However, when given some descriptions of both methods, and they felt some greater understanding of the methods, a majority selected individualized instruction. Lange's study (1972) gives an overall perspective on this area and the effectiveness. Between 1962 - 1964, 112 studies showed 40% of the programs to be superior, 49% no difference, and 9% inferior. The areas of (1) attitudes of students, (2) independent instruction versus traditional instruction and (3) who benefits - high-achievers or low-achievers, or both - were the crucial questions to be answered. An immediate quantitative analysis of this 'new' approach was essential due to problems emerging from an attempt of a transition to the individualized instruction method.

Basic Assumptions of the Study

It is assumed that students will fall in the normal distribution curve as to the population used in the study.

It is assumed students had an equal chance to learn about at least one form of independent-individualized study.

Limitations of the Study

Several limitations are obvious to the researcher.

This study is valid for a community college population since it is a population of a specific community college. Therefore, it would be error to generalize the findings to other than community colleges.

The reliability and validity of the questionnaire used in the students' attitudes section has been established (Herrscher, 1971, p. 31). The questionnaire may have had some biases which this researcher tried to ascertain and correct with some degree of success.

The study was only valid to the questions proposed, and did not intend to deal with quality of individualized instruction programs, or the teachers' role. These areas should be researched in another study.

The study was limited to students in Sociology, English, Earth Sciences, and Humanities, and the attitudes and achievement of those who have participated in individualized instruction and traditional methods in some form at the college.

DEFINITION OF TERMS

Students were defined as persons enrolled for credit at St. Petersburg Junior College.

Traditional methods were the conventional ways of presenting thecurriculum (lecture, discussion, group-discussion or projects).

Independent-Individualized instruction was defined as self-instruction methods where the students work in a high degree of freedom or independence not expressed in traditional methods. (e.g., audio-tutorial, independent, personalized, individualized, self-paced instruction).

Population random sample was a sample of students who have participated in some form of independent-individualized instruction.

High-Achievers were based on a numerical score of 81%-100% on the post-test for Task 4.

Low-Achievers were based on a numerical score of 80%-50% on the post-test for Task 4.

The Major Research Questions

The following five questions were to develop criteria (standards) for successfully counseling students toward independent or traditionally oriented classes. These criteria emerge from the five questions which should be answered in this study:

Which method produced better results? Or was there any difference between individualized instruction and traditional instruction?

What did students think of the independent-individualized instruction methods? (attitudes)

Were student attitudes any different according to age, sex, or rank in relation to independent-individualized instruction?

Was there any relationship between age and educational level in success/or failure in independent-individualized instruction?

Was there any relationship between autonomy, endurance, achievement, gradepoint average and final success in independent-individualized instruction?

These five questions emphasized the major issues this study attempted to investigate as research questions. There may have been more issues in the question, "Who benefits?" However, the researcher limited this study to these five areas.

The student, before he has to make a choice, should have some understanding of his predictable success/or failure in individualized instruction. Therefore, the study attempted to isolate criteria for entry into sociology courses, which would help guide the student into either individualized instruction or traditional instruction-oriented learning environments.

Guiding Hypotheses

Five hypotheses were tested to help establish the criteria for this end -- to help the student choose the method he would find rewarding in meeting his educational needs.

Hypothesis 1: There would be no significant differences between traditional instruction mean scores and individualized instruction mean scores of the two groups tested.

Hypothesis 2: Students would accept traditional and individual methods of instruction equally, and there would be no significant differences in the four independent groups' mean scores on their attitude toward independent-individualized instruction and traditional instruction.

Hypothesis 3: There would be no significant differences among the three groups' mean scores according to age.

Hypothesis 4: There would be no significant difference in the mean scores according to educational rank or level of attainment.

Hypothesis 5: There would be a zero correlation between scores of the students in relation to their autonomy, endurance, achievement scores (Edwards' Personal Preference Scale), and grade-point averages for the individualized instructional unit completed when correlated with the posttest scores on unit completed.

The Research Design

Statistical Analysis of Data fell into four task areas or distinct procedures. This study developed a design to test the results of traditional method and independent-individualized method and students' performance. Attempted research on the two methods of instruction prompted a study of the test results of (X_1=30 & X_2=30) the two groups. The pretest was given to X_1 and X_2. The post-test was given to X_1, and X_2 was given the tests on an individual basis whenever the student was ready and so indicated his readiness to the instructor.

The first procedure in the collecting of the data was to pre-test sixty (60) student in two (2) separate groups on the area of social institutions in Introductory Sociology. The procedure was as follows: Group X_1 was given the pre-test in a regular class period. Group X_2 was given an identical test the following day in a regular class period.

Group X_1 was continued on 'traditional' classroom methods. Group X_2 was given individualized 'packet' and explicit instructions as to individual help available, both in the regular class session and the office of the instructor.

Both groups were given the post-test (identical), Group X_1 at the end of the work on social institutions; Group X_2 was given the post-test on a basis of the individual's request whenever the student finished the packet.

Procedures for treatment of the data were as follows: A mean score and standard deviation were run on the two groups (X_1 and X_2). Then a 't' Test for Related Measures was run.

The second task necessitated a design to investigate student attitudes toward traditional methods and independent-individualized instruction.

Procedures: (Collecting Data)

A questionnaire adapted from Herrscher (1971) (Appendix, p.86), was used to carry out a random sample of 300 students. This was 10% of the total population, and approximately 50% of students taking some form of independent-individualized instruction.

The sample was drawn from 4 major departments: Humanities, English, Natural Sciences and Social Sciences. Students were those who had participated recently in some form of individualized instruction.

A stratified random sample method was used to divide the groups on the basis of sex (Male X_1 - Female X_2) and rank (Freshman X_3 - Sophomore X_4). This involved a design of 4 groups of 20 per group ($X....X_4$). $X_1 = 20....X_4 = 20$).

The questionnaire was based on a Likert Scale of five points from left to right. A mean score of less than 2.5 indicated a rejection of independent-individualized instruction, while a mean score of more than 2.5 indicated an acceptance of independent-individualized instruction. The four groups were divided using criteria for a stratified random sample (Tuckman, 1972). The data were collected during the Fall semester. Precaution to insure that no student would be in two different groups was taken.

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Procedures: (Analysis of Data)

A mean and standard deviation for students was run. Then the four (4) stratified random samples were set up in a design of four groups (X_1, X_2, X_3, and X_4).

The score of each individual student was calculated in each group.

The data were analyzed using the following methods. A mean and standard deviation for each group was run. Then, a combination of the four groups was arranged to give a possible six (6) t tests on the data, or groups.

The statistical test (procedure) used was a t test for a Difference Between Two Independent Means on the following combination of groups means:

(X_1, X_2) (X_1, X_3) (X_1, X_4) (X_2, X_3)

(X_2, X_4) (X_3, X_4)

Procedures: (Collecting Data)

This task necessitated a design to collect data from a TV course on Ecology in the Summer term, 1974. The course was set up completely independent of, and with little or no contact between the instructor and student, except for two examination periods - 2 hours.

There were 105 students beginning the course (SY 227-659) on a college-wide registration. Age, sex and educational level data were collected from all students at the beginning of the course. Each student had a text, a local supplement revised by the researcher and a series of television tapes - 30-minutes each - viewed via TV in the home. Each student was on his own, except for the use of a private telephone, or came to the researcher's office for help.

Procedures: (Analysis of Data)

A record of each student was carefully compiled. Grades from the two examinations were used in evaluating the students' performance. A random sample method was used. Each student was divided into groups as to age - under 21 = X_1; under 30 = X_2, and over 31 = X_3. An Analysis of Variance was run on the three groups. Each student was stratified according to educational level -- 1) Freshman, (2) Sophomore, and (3) Undergraduate or Graduate students, or three groups*, and an Analysis of Variance was run on the three groups.

A design to investigate the correlation between autonomy (Edwards' Personal Preference Scale), and performance (post-test) in individualized instruction was the task in this area.

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* The Ecology course (Summer, 1974) had a wide distribution of students as to age and educational levels (age from 18-55 years; educational levels from freshman to Masters degrees).

Procedures: (Collection and Analysis)

The procedure for collection of data was as follows:

A group of 50 students was selected from volunteers for an experiment in the Fall term, 1974. The students were given the Edwards' Personal Preference Scale test and only the areas of autonomy, endurance and achievement scores were used. Then, each student was given an individualized unit in Sociology - Vol. 5, Units 9 and 10 (organization and collectives), purchased from Individual Learning Systems, Inc., P. O. Box 2399, San Rafael, California. Each student was given the chance to work on the two units at his own pace with individual help available on call by the student.

At the completion of the Volume V, each student was given a posttest. The scores from the posttest were correlated with the autonomy, endurance, and achievement scores obtained on the Edwards' Personal Preference test.

The Pearson Product-Moment Correlation was used to determine if there was any correlation between grade-point average and posttest scores. A second investigation tested any correlation between autonomy and posttest scores-performance. A third test was run on endurance, and posttest scores, while a fourth test was run on achievement and posttest scores. The Spearman Rank-Order Correlation test was used to test any

significance between correlations listed in the three areas.

Implications and Significance for the Dissertation

Independent-individualized instruction is not for every student! This was the guiding principle which evolved around this Major Research Project or study. The researcher's experiences in making the transition from traditional instruction to individualized instruction, both positive and negative in nature, caused this study to evolve.

There were three reasons for this study which are crucial in the attempt to travel the road of transition from traditional methods to the several methods of individualized learning situations.

It was less than candid to assume that a college policy of scheduling classes according to traditional methods of learning would change overnight to an individualized approach for all students. Therefore, it was essential to set some criteria on which administrators, students, counselors and teachers could make a judgment on open-class-enrollment and changing the structure, time and teaching methods in the traditional college environment.

The study was very important since it attempted to establish some basis for students to judge their chances for

success in independent-individualized instruction environments. It was possible to use these criteria in this study to help them decide which road they wanted to follow. The students should have a choice with college help in prediction of outcomes.

The most significant aspect of this study was based on the fact that some statistical data had been established to guide students in electing to take a course via traditional method or independent-individualized instruction. It was not just 'try it, you'll like it!' philosophy. It gave some concrete empirical criteria for both the college policy-makers and/or faculty, and students in an area where literature indicated little had been done for other than Developmental Studies Departments.

The study attempted to establish a set of criteria which students could identify simply and rapidly, except for the autonomy, endurance, and achievement scores as per the Edwards' Personal Preference Schedule criteria. However, the researcher thinks that the probability of a student meeting most of the criteria would be sufficient to predict success in an independent-individualized environment.

Finally, the study would be the beginning of developing a model to better predict the 'average' student's success. At this time, most studies center around 'remedial' or 'developmental' programs and students. It is the researcher's growing belief that many developmental programs could be synthesized into the 'regular' programs in college curriculums.

Roueche and Kirk (1973) and Moore (1971), discuss students' awareness of "stigma," or "prejudice," and the methods of selecting faculty. Both writers agree that a new type faculty must volunteer for Developmental Studies programs. This would possibly help remove the stigma of prejudice against the remedial programs since the students would not be isolated or set apart from the mainstream of college courses. The open-door, travel at your own pace, would let the students enter regular classroom situations. The last implication was a most serious problem here at St. Petersburg Junior College. The Director of Directed Studies on the Clearwater Campus, St. Petersburg Junior College, discussed this area with the researcher and concluded change was essential. However, this Major Research Project was not directed toward the low-achieving students, per se. It was a general approach to the 'new-student' on the campus who does not need or want a label!

Organization of the Remainder of the Dissertation

The structure of the Major Research Project followed this sequence: Chapter two reviewed the literature in the field, both general works and specific task areas. Chapter three presented the results and summarized the findings. Chapter four discussed the conclusions and recommendations, and chapter five emphasized the significance and implications of the study for independent-individualized instruction in the community college.

CHAPTER II

A REVIEW OF THE LITERATURE AND RELATED RESEARCH DATA

An Overview

> "The prime function of education...(is) to bring men into possession of their culture...The curricula must be continually rejuvenated through innovation, now more urgently than yesterday." (Goodlad, 1970, p. 22)

The community colleges are not tradition-bound as are the University systems in the nation. Therefore, they should be able to present the leadership, change, innovation and experimentation essential to meet the pressures for efficiency and improvement in the area of Curriculum and Instruction. (Johnson, 1970, pp. 9-12). The community colleges are primarily teaching institutions and are thus charged with the responsibility to design learning environments that enhance openness, flexibility, individuality and human potential to its fullest. This is an optimistic view of the nature and function of the community college (Scanlon, 1974).

Scanlon illustrates three alternatives for innovative schools of the future. First, some schools are providing individualized options which are student oriented. Second, other schools have programs aimed at higher-order cognitive, interpersonal, and achievement-competence training, while a

third alternative emphasizes career-education (Scanlon, 1974, p. 119). The first alternative is the major emphasis. He calls it "Personalized Education."

The concept of individualized instruction involves personalizing the instructional process to meet the learner's needs and abilities. This involves a variety of educational technologies. Also, it involves an extensive modification of classroom management and administrative rules and regulations. Individualization of instruction necessitates changes which support the individual, rather than adherence to prescribed programs and curriculum. "In short, individualized education implies personalization of the entire educational process, not simply its instructional aspects." (Scanlon, 1974, p. 119)

The heterogeneity of the community college population and the human variability demands a recognition of education alternatives required by students. The problem is to respond qualitatively to the profound needs of education, to diagnose this human variability within the individual, as well as within groups. Goodlad*, in his study of 250 classrooms in the United States, found that there was a wide range of instructional materials in use. Nevertheless, there was a small

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* See B. Lamar Johnson, Editor, in Unpublished Works

degree of provision for individual differences. However, there was no overall design change, rather, change tended to be sporadic (pp. 27, ff). This would agree with Gleazer (1973) and Roueche and Kirk (1973) that the community colleges had unusual opportunities for development of curriculum and instruction methods.

Goodlad concluded that effective instruction in the community colleges would be attained when the attrition rates, estimated between 67 percent and 75 percent for all students, and up to 90 percent for high-risk students, were drastically reduced (Goodlad, p. 33).

The quality of instruction in the community college can be improved because of the 'newness' of the institution that is not tradition oriented, and it is not a research oriented institution. It is just the opposite - a teaching oriented institution. However, change has been rather slow in coming (Gleazer, 1973; Roueche and Kirk, 1973; Moore, 1974). Turner* states,

> "It appears to me that we have not encouraged our teachers to break out of the traditional. There is fear of failure. There is job insecurity. There is too much subjective evaluation. There has developed a polarization

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* See Northern Illinois University Report in Unpublished Works

> between faculty and administrators. There also has developed a caste-system in too many institutions where students are recognized as second-rate citizens..." (1972, p. 69)

While Turner suggests the necessity for institutions (faculty and administrators) to be willing to recognize success or failure in instructional methods (technologies), a serious problem (fear and insecurity) emerges as attempts are made to bring about changes in these institutions. This problem can be met if the institution, administration, faculty and students bring it into the open. It can be ascertained that many educators, in high administrative positions, are open to and advocating the changes which will recognize the challenge of the heterogeneous community college population and individual human variations - needs and abilities.

In a status report, Walter E. Hunter (November, 1972) summarized the state of Individualized Instruction for the Conference.* First, Individualized Instruction is the "in word" in community colleges due to the heterogeneous student population. Second, is the demand for comprehensive programming and the open-door admissions policy. Yet, he says that most community colleges are group-oriented in instructional modes. Many colleges have some form of individual learning activity: programmed formats, tutorial, multi-media,

* From the Second Annual Three-Site National Assessment Conference on Individualized Instruction, 1972 (See Unpublished Works)

and varied-pace formats.

He then cites the plethora of literature and researchers in the area of individualized instruction modes. For instance, he cites Chapman, Cohen, Johnson, Roueche, Herrscher, Rita and Stewart Johnson, Tirrell, Canfield, Blank and Bloom. Then he uses Roueche and Pittman, A Modest Proposal: Students Can Learn, 1972, as the work which pricked the conscience of the educational community. One should add to this august group of scholars William Moore's two excellent works: Blind Man on a Freeway (1973), and Against the Odds (1971), since he has been a consistent, angry and aggressive proponent for change to meet the personalized education concept.

Hunter found opposition of his assessment of the cost to educate each student. He suggested that costs were higher for group oriented traditional classroom modes of instruction and less for individualized modes of instruction (p. 5). However, if both groups (traditional oriented and individual oriented) were equally motivated, the costs would be about the same. If students were a highly heterogeneous population, individualized instruction modes would be both superior in quality and lower in cost.

Just the opposite conclusion was reached on cost by Harper (1973). She suggests that due to cost factors many educational institutions may be willing to finance an individualized instruction system for only part of its student population. She suggests three approaches to selectivity: (1) the most advanced courses; (2) the first year courses; (3) the selection of students who would potentially benefit most from individualized instruction. No means of selection of students has been suggested but she recommends selection on a basis of mental ability or aptitude and the cognitive mapping of students.

An Individualized Instruction Program Outlined

The research literature is weighted toward Hunter (November, 1972), who discussed the advantages of individualized instruction by giving a rationale in three parts: (1) Learning is essentially an individual phenomenon with respect to the pace of learning, the time for learning and the mode of learning. (2) Teaching consists of motivating, guiding, prescribing, encouraging and tutoring each individual student. Therefore, the teacher's role is one of a manager of the learning process. (3) Evaluating learning consists of established standards of achievement and the validity of student achievement when the standards are satisfied. Teachers should use

criterion-referenced measurements.

Then Hunter lists nine advantages which favor individualized instruction: (1) There is the possibility of more meaningful contact between teacher and student; (2) Learning can be instituted at the most appropriate point of entry in the learning sequence; (3) Each student can participate in the decisions relating to modes of learning time, and adequacy of learning; (4) Each learning sequence can be developed so as to use the several media appropriate to efficient learning; (5) There can be a back-up system for each learning activity which increases the probability of success; (6) There can be a free exchange of ideas among the students and instructors; (7) Each student develops a sense of responsibility for his own achivement; (8) A combination of learning activities - group and individual can be used. Finally, (9) the cost-effectiveness of the instructional process can be increased through the efficient use of facilities, material and personnel (1972, pp. 5-6).

Piper*, at the same conference, indicated individual instruction modes are successful only because they are a novelty. (p.21) He concludes that students feel they must be self-actualized, self-motivated, self-starters; otherwise, the

* See Northern Illinois University Report in Unpublished Works

equipment would go unused. He thinks that it is necessary to identify what students can most effectively use individualized instruction prior to their entry into the programs (p. 21). What he suggests is the necessity of a predictor of success or failure prior to student entry into courses.

Christensen*, from William Rainey Harper Community College, suggests that administrators construct roadblocks to prevent instructors from carrying out individualized instruction modes. He emphasizes one problem Turner's critical evaluation mentioned earlier, as he gives an example of the necessity of the instructor to carry the student the following semester if the student does not meet the semester structure and time, as a part of the instructor's regular load (i.e., Administrative roadblocks). (1972, p.8)

A reference was made to the problem of anxiety in several learning situations when the researcher attempted to introduce individualized instruction into the learning environment (p.1). Kost's (1969) study was carried out to determine the effect of a program of individualized instruction on social and personal adjustment of elementary school children. He divided the 573

* See Northern Illinois University Report in Unpublished Works

students into three ability levels (high, average, and low). He found that there were no significant differences between students enrolled in individualized studies and those students in traditional classrooms. However, he found there was a positive relationship between academic achievement and social and personal adjustment.

Jung's study (1972) raised the question of the relationships among second grade student perceptions of their learning environment, personal characteristics and achievement. Although his study deals with an elementary school age, his use of the children's Manifest Anxiety Scale was valuable in that it indicated a relationship between anxiety and satisfaction. Yet, Hansen (1972) contributed a more concise work related to the question of anxiety and the learning environment. He attempted to help resolve the controversy as to whether programmed or traditional instruction was a superior method of learning. He related the methodology of instruction and the students' anxiety level. Two dependent variables were used - acquisition of technical terms and the application of principles. He selected the students according to high, medium, and low-anxiety levels. One group used traditional methods while the other group used programmed materials. All students were treated alike except for the methodology of instruction. He

found that the mode of instruction was an important factor when related to the students' level of anxiety. High anxiety level students were significantly more successful in programmed instruction than either medium or low anxiety-level groups. Hansen concluded that programmed instruction gave the "high-anxiety" level group a controlled structure that facilitated the learning process.

Oner's study (1971), on the relationship of programmed instruction and high and low anxiety boys and girls, found significant relationships between sex and anxiety effects on learning and achievement. Also, significant negative correlations between anxiety and intelligence, anxiety and achievement were noted. Just the opposite of Hansen's high-anxiety level group, he found "low-anxiety" subjects; girls performed better than other groups under conditions of the study. However, Hall (1969) indicated a paucity of research data on performance and anxiety. He attempted to overcome the weaknesses in this area of research by providing a relationship between anxiety and learning-performance. Male seniors from two Florida high schools made up the population sample. They were administered a test to measure Trait anxiety and a pretest; then, they were assigned to Stress and Nonstress instructional groups. A posttest was given to both groups. He found no significant

differences related to anxiety. Hoffnung (1970), in his study of 325 female sixth grade students on anxiety and feedback in programmed instruction, found no significant interactions between anxiety and performance, and discussed possible influences on performance and high and low anxiety children. Campeau's study (1968) supports Hoffnung, while O'Neil, Spielberger and Hansen (1969) tend to refute the two studies cited. The concern for the anxiety manifested in the learning environment (see p. 1) was a phenomenon of lesser importance than motivation, attitudes of students toward instruction, grade point average, other personality needs, and types of instructional methodology.

The conclusion on these research data was that anxiety may be a factor. However, a necessity to move toward other variables would be more profitable to the immediate study.

A Study on the Learning Environment

The question of the superiority of independent-individualized instruction over traditional methodologies was one of the most important for this work. Fader (June, 1971) advocated individualized methods for remedial English in a heterogeneous environment as over against group or lecture methods. He thought the expectations of the teacher helps continue students to express the behavior-failure. He uses the analogy of a

terminally ill patient and a desperate medical doctor type of situation. He recommended a restructured learning environment to independent-individualized learning situations instead of (1) homogeneous grouping, (2) large classes and (3) single-teacher institutions. See Scanlon (1974, p. 120), for a more comprehensive discussion.

Kress (1969) researched the problem of heterogeneous and homogeneous grouping and found no significant difference in dependent measures. His study suggested that students who work individually were more efficient in terms of learning. However, social interaction was clearly inhibitory to learning. While there were no significant major effects to grouping strategies, he did find a relationship between the interactions of group similarities and abilities as indicators of completion time and attitude toward the program, in relation to group strategies. The placing of low-and high-ability students in heterogeneous groups seemed to have speeded up learning for the low-level while slowing the high-level ability students. The study did not confirm the superiority of either form of grouping strategies; it did support the need for more research in the area.

Foster (1969) compared the effectiveness of programmed and non-programmed approaches to learning - a linguistically-

oriented programmed kit for fourth and fifth grade children. Two problems were investigated: (1) achievement gains in reading vocabulary and (2) achievement gains in reading comprehension. The population size was 1021 students from Georgia-Florida public schools. Thirty percent of the population attended disadvantaged schools. The experimental group (programmed instruction) made higher gains in the area of spelling and reading comprehension. However, vocabulary development was not improved in the experimental group. His conclusion was that if students can read they would learn regardless of the method.

In a study related to reading and educable mentally retarded children, Carey (1968) tested the effectiveness of three methods of teaching. One group used programmed methods while two groups utilized conventional instruction methodologies. Fifty-one educable mentally retarded children comprised the population. The results suggested a need for systematized sequential ordering of materials with regard to difficulty and the use of basic principles of learning, but there was no superiority in either programmed or conventional methodologies for word recognition. There was a significant difference for the conventional methodology in regard to comprehension of materials.

In a study for educable mentally retarded children in junior high school, Brown (1970) investigated the utilization of techniques for individualized instruction. He used two groups. One group used individualized instruction techniques while the control group used non-individualized instruction techniques. The population consisted of twenty-six students. The two classes were compared in the areas of word knowledge, word discrimination, reading, language, arithmetic computation and arithmetic problem-solving concepts. The conclusions were significant; differences were found in the experimental classes (individualized instruction) in all academic areas except language.

While most researchers cited thus far have been dealing with other than community college population, Wenrich (March, 1971) in his highly successful experiment at the College of San Mateo, attempted to ascertain whether participation in individualized instruction programs would relate to lower attrition rates for first-time freshmen who were identified as potential drop-outs. Forty-nine students were involved in the individualized approach and forty-nine students were involved in the traditional approach; both groups were potential drop-outs. Each student was evaluated on (1) the lack of academic

skills, (2) or the threat of the possibility of failure, or (3) the lack of specific goals, or (4) the inability to work within the system, or (5) was poorly motivated academically. The results showed no significant differences between the two groups except for fewer drop-outs, lower attrition rate, and a positive attitude by not equating low scores as failure in the individualized instruction group. Second, many students became more independent or more self-confident. This is similar to Roueche and Kirk's (1973) findings. Two other results were (a) more students in the experimental group registered for a second semester, (b) and more students received a "C" average in their total college work.

Jenkins' (1972) work summed it up as he suggested the possibility of utilizing both independent and small group formats in an integrated instructional program. He also suggested the audio-tutorial programs may be used successfully in small group environments. A more successful study for independent study found a significantly higher score for the experimental group in Business Math. Williams (1972) used a pretest and posttest to evaluate the three instructional methods on identical material. It measured achievement and attitudes of the students. While attitudes within the two groups remained unchanged, the achievement scores differed in favor of programmed

instruction. The conclusion was that cognitive skills may be more effectively taught by this method.

These findings continue to emphasize the differences and difficulties in any attempt to qualitatively measure the results of the different teaching techniques or methodologies. Haines (1973) found no significant differences in his study of eighty-three students at the Oregon Dental School in his random selection of four treatment groups. He used the pretest-posttest design to validate his hypothesis and found no significant differences as to response and presentation modes.

It is essential that the environmental question be discussed at this point since the argument of superiority of Independent-Individualized instruction over traditional methodologies demand a drastic learning environmental structure. Walker (1972) did an inclusive work in this area. He attempted to investigate the effects on reading achievement of the two different environments. He used an open-learning environment with personalized reading instruction. A control group was exposed to a traditional-learning environment with a basic text and group instruction. His population was from Michigan Public School District at Albion, Michigan, with a population number of eighty-five students. The results of the study

showed no significant differences between the experimental and control groups. There was no significant difference in achievement in any area tested. There were significant differences in both groups according to sex. The female subject achieved more in a personalized-environment than in the total control group population.

A Study of Personality and Societal Factors in Learning

Another area in the learning environment, and possibly very important, is the students' choice of independent or traditional learning environments. Horn (1971) investigated the relationship between personality variables and student choice options for both forms of environment. The population for the data involved 118 graduate students enrolled in "Library Science" at the University of Michigan.

The students were given their choice or preferred method of instruction at the beginning of the semester. Personality tests were administered during the semester to both independent and conventional students. Horn found that students in the independent study group did significantly better than the conventional study group on criterion tests. Also, students in independent study differed on two personality measures. First, women in the independent group scored significantly lower on the Marlowe-Crowne Social Desirability scale.

Second, students who chose independent study scored lower on the Omnibus Personality Inventory in the area of anxiety. No other differences were found in the personality test results. However, other results suggested independent study saved students time. Cost per student hour to the college was less expensive. The opposite results were found by Lisson (1970) in her study of computer-assisted instruction and student performance.

More research on personality characteristics has partially contributed to a method of prediction of student success. Haskell (1969) used the ten specific personality traits from the Guilford-Zimmerman Temperament Survey to investigate the relationship of personality variables and academic performance to the two specific instructional methodology-independent and traditional. A population of 163 students was divided into three groups (N=78, N=67, N=18) to compare treatments.

The results were similar to most other studies, namely, no significant differences in methods of instruction between the different groups. There were differences on students scoring high, medium, or low on Restraint, Emotional Stability, and Masculinity. This indicated that students who were serious-minded and persisted (high Restraint) did significantly better than other students. Emotionally stable students

did superior under both methods of instruction. Also, programmed instruction seemed to be more promising for students who were agreeable (high Friendliness) and were low on activity (low General Activity). Conversely, those who were characterized as aggressive (low Friendliness) did better in conventional instruction. The General Activity and Friendliness scales of the EZTS were helpful in predicting student success in either form of instruction.

In her study on Motivational orientation and programmed instruction, Dobbs (1967) found her secondary expectation of superiority of individualized to conventional instruction was supported. However, her attempt to link motivation to individualized instruction was less than significant over all. There were no significant interactions among the motivational variables on success in either arithmetic computation and arithmetic problem-solving results.

What has emerged out of most of these studies indicated an attempt to discover personal and social factors that enhance the learning situations. Yet, even in elementary and secondary, in special education and higher education, the answer has been, and is still evasive to researchers.

One disturbing factor that contributes to the lack of success in research in this area is the 'teacher variables.' This is an area which would lead one down a difficult road. However, Gomes (1969), in the last part of his study, emphasizes the problem in relation to student success or performance but draws no conclusions. This work has as its major concern the student and the learning environment. It is necessary to continue a discussion of personality, performance, and academic achievement as a means of answering the questions, who benefits from independent or conventional instruction?

Rasheed (1969) studied the effects sixteen personality factors had on academic achievement in a programmed learning environment. His population sample consisted of graduate students at Auburn University in a course "General Science for Teachers." Fifty-eight students were involved in a non-programmed learning environment while eighty-one students were involved in a programmed learning environment. He found that sizothymia, intelligence, imaginativeness, self-assuredness, and abstract-thinking were important indicators of success in independent instruction environments in sequential order as listed above.

Both Spollen (1970) and Nitsos (1970) have done studies on the effect and/or influence of individualized instruction (programmed) on students. Both were interested in the cognitive outcomes for students. Spollen studied kindergarten children (717 subjects), and found a lack of significant differences between the experimental and control groups in cognitive growth. His findings indicateda possible introduction into the learning environment of programmed instruction was too early - chronologically.

Nitsos' study was on a college population (N=128) divided into four equal treatment groups. He attempted to research the hypothesis that teaching cognitive content via programmed instruction could increase affective involvement of students. After extensive testing, the results were not conclusive. Cognitive and affective measures as ranked showed no correlation with the predicted outcome.

Do students really want independent individualized instruction? Connolly and Sepe (June, 1971) attempted to research this question. Most research indicates a need for student choice. This study attempted to measure student (1) acceptance of individualized instruction, (2) identify positive and negative factors of individualized instruction as

perceived by students and (3) identify the characteristics of students selecting individualized and traditional methods of instruction.

The study population samples were from Harford Community College and students from three other local colleges in Maryland. The results of this study indicated that only fifty percent of the student sample preferred individualized instruction. However, the majority of the students indicated a preference for almost all of the characteristics of individualized instruction (eg., self-pacing, emphasis on the individual, grading based on achievement of objectives). This was similar to Jioia's (1972) findings where he emphasized the same three findings as Connolly and Sepe. Also, both studies emphasized the students' preference for greater interaction between students and instructors in individualized methodologies.

Jioia (1972) also listed a more flexible scheduling as a negative factor because too many students tend to procrastinate and feel the loss of class identity and class discussions. Connolly and Sepe list negative reactions of students as rejection, in part, of student responsibility for learning. These factors tend to indicate strong negatives for students who participated in both Jioia's and Connolly and Sepe's

studies.

Connolly and Sepe's studies had more value in the concise, brief and distinctive description of the individualized and traditional methodologies. Individualized methods emphasized the individual while traditional methods emphasized the group. The former demanded prior specific definition of goals while the latter emphasized more generalized goals. Again, individualized instruction used the cyclical process; that is, materials were used on students, tested and revised as a result of the evaluations, until the instructor was satisfied the goals were reached. Possibly the most important positive aspect of the individualized instruction group results was the prompt feedback and correction process, and the removal of rigid time constraints that allowed for personal differences and individual learning rates or styles. Another study in this area was conducted by Sulzen (1972). The students choosing traditional instruction methods (23.2%)* did not want to direct their own learning situations or remove the highly structured learning environment. These same students liked competition, worked better under pressure and

* Students choosing individualized instruction measured 36.6 percent. However, there were several variations that are listed in the study and were not related to this study, and would have to be included to make a 100 percent total.

wanted the grade "A" or "B" in relation to this competitiveness.

The final conclusion of these studies indicated the 'lock-step' method in secondary and post-secondary education has been ingrained in all who pass through the educational systems and students become passive learners. This area was covered earlier (p. 4) in a discussion of 'passive' or 'active' students, per se. However, Cross (1971) indicated a new variable. Namely, students may not understand individualized instruction methodologies. Therefore, Bloom's (1968) approach that no one system can meet all students' needs sums up the difficulty presented in decisions about who uses what methodologies to meet educational goals. Also, see the Report, Miami-Dade (June, 1971) for more discussion on this need for alternative choices for students in instructional environments. It was an excellent work that indicated similar conclusions.

The last area of concern to this study was specifically the correlation of achievement, gradepoint average, autonomy and endurance with performance scores for students in individualized instruction.

In a study which dealt with problems inherent in individualized instruction, Barton (1972) used the variable-gradepoint

average as part of his study. He hypothesized that students with high gradepoint averages would obtain significantly higher achievement scores than students with lower gradepoint averages. His population involved 101 elementary education majors. This hypothesis was accepted in the results of his study. There was a significant correlation between gradepoint averages and achievement scores. However, there were no differences between medium gradepoint average students or low gradepoint average students at the $p < .05$ level of significance.

Student Self-Image and Performance

Roueche and Kirk (1973) used mean gradepoint (GPA), persistence (completion of semester hours) and student attitudes toward the counseling, instruction and the total program (Developmental). This study dealt with developmental programs for community college high-risk students. The results of their study in the Southeastern area of the United States found highly significant differences between the high-risk students in the developmental programs and the students in the regular college program. They earned a "B" average (2.91), while students in the regular program (high-risk students) earned less than a "C" average (1.91) (1973, p.53). Black students showed the same significant gradepoint average - "B" in

the experimental groups and a low "C" average in the control groups. Overall, the study indicated two points. First, that there was a definite re-entry shock during the semester that the remedial students entered the regular college programs. Second, that there was an increase in gradepoint averages in the second year for the experimental group.

The conclusions were that gradepoint averages increased as the students became more familiar with the programs. This would tend to validate Cross's (1971) findings that students do not understand individualized instruction. Whenever students had time to familiarize themselves with the developmental program demands, in the study of Roueche and Kirk, their gradepoint averages increased. The number of students dissatisfied with, or undecided about the independent approach to learning was similar to the percentage found by Connolly and Sepe and Jioia. However, a wide range of students expressed satisfaction with the program (eighty-three to sixty-one percent) which averaged about seventy percent.

In Roueche and Kirk's previously cited work, the researchers used the term self-concept development to discuss the innate worth of the individual student and his development of a positive self-image. "The typical (community college)

students exhibit less social maturity and autonomy..." (1973, p. 69). These students needed to develop a self-image to improve their performance in an academic environment.

Schmitz (1972) examined the performance of students categorized as self-actualized and non-self-actualized, according to the Personality Orientation Inventory. Students were enrolled in four sections of a psychology course at a large non-resident community college in New York City. Two sections (N=66) were randomly assigned to a selected group method of instruction, while the remaining two sections (N=75) were assigned an instructor-centered approach.

The results were that no significant differences were found between the treatments and self-actualization, or in the areas of performance, sex or teaching categories.

Ripple, Millman and Gluck (1969) attempted a study in twenty-two schools in English classes. They were roughly matched according to a distribution of mental age scores, and sex. The student characteristics (anxiety, compulsivity, exhibitionism, convergent-minus-divergent thinking style) were compared with their relative learning success in programmed instruction and conventional instruction. In each of

the four criterion measures there was a failure to reject the null hypothesis of no interaction between student characteristics and instructional mode on learning criterion.

Davis, Marzocco and Denny (1970) conducted two experiments to study the interaction of individual ability and attitude differences among college students with different modes of instruction. The first experiment had a population of 166 students in an algebra program using different modes of presentation at Michigan State University. Most students were male (N=160) and freshmen (N=161) who were majors in departments requiring math. Individual differences were measured as to ability. An attitude scale was used (Aiken, 1960) to obtain a measure of each student's attitudes as well as ability scores.

The second experiment: 180 students completed two short programs in Introductory Psychology. The original sample consisted of 292 students enrolled, and 246 students participated. However, only 180 took both pretests and posttests. This limited the original population to those who completed the programmed texts and tests.

The results indicated no significant differences between

the learning outcomes and ability, or performance and attitudes. No significant interaction was obtained. In one area, where students were allowed to select their own mode of treatment, they did not do significantly better than those students assigned by the experimenters to specific modes of instruction.

Results of Studies on Personality and Learning Environment

Overall studies on student personality characteristics and performance or success in learning environments have been less than productive. Even Roueche and Kirk's (1973) work was seriously criticized by Knoell in a review published in the "Journal of Higher Education" (April, 1974). She concludes that "the authors have not looked at new alternatives to remedial and developmental programs, which do not require separate courses, ... division, ... and voluntary staffing." (p.310). She commends the work and suggests it merits a space in the libraries of colleges. However, in defense of the work, one finds Roueche and Wade offering a constructive alternative to the theoretical arena where talk has been lucid and programs few and mostly ineffective. The thrust of these two educators has been to move toward changing the patterns of student learning from one of dependency upon the instructor to one of independent responsibility for his own

learning.

Humphreys (1972) contributed to the self-image of achievement and academic achievement in his study of high school students in biology. He used two classes (N=29, N=28) with one student-structured self-pacing; the other class used teacher-structured self-pacing. However, he found no significant difference in self-image and achievement. His conclusion was that many students did not understand the pattern of learning concept. This would reinforce Roueche and Kirk's persistence in the program findings mentioned earlier.

Williams (1972) studied the relationship of self-esteem and achievement. He tested two hypotheses: (1) students who learn language skills and math skills through self-learning individualized methods will achieve more than students taught the same subjects in a conventional manner; (2) students who devote a majority of their time in school assuming responsibility for their own learning will develop higher self-esteem than students taught in a conventional manner. The population was randomly selected from New York City and suburban Long Island. A total of 112 students were selected for four groups (N_1=28; N_2=28; N_3=28; N_4=28). Out of eight comparisons,

seven plans showed no significant differences. The hypotheses were not sustained.

Ojala (1969) investigated aptitude-treatment interactions in an attempt to discover if any educationally significant interactions between measurable student abilities or aptitudes and particular programs in English grammar. The population consisted of tenth-grade students (N=174) over a five month period. Again, no significant interactions were revealed.

Brucker (1969) studied the effects of an enclosed learning environment interacting with two personality traits on the achievement and opinions of college students learning through the use of programmed instruction.

The Sixteen Personality Factor Questionnaire was administered to every student (N=92). The two factors used were (1) anxiety and (2) permeability (extroversion - introversion).

The study concluded a significant relationship between environment and personality as evidenced by immediate achievement and delayed retention scores for students grouped on anxiety. Also, students with high anxiety scores held less favorable opinions on individualized instruction. Finally, even though individual differences were apparent, all students learned quite well through individualized instruction.

The final study (Blitz, 1972) investigated whether personality characteristics provide any useful criteria on which to base aptitude-treatment interaction effects.

The population consisted of University of Kentucky College of Dentistry third-year students (N=51) who were matched for gradepoint average and then randomly assigned to two groups. They took a course in oral pathology through computer assisted instruction and a programmed text. Personality characteristics were ascertained by administering the Edwards' Personality Preference Schedule to all students as well as an interview with each individual.

It was hypothesized that students characterized by the Edwards' Personality Preference Schedule as diffident, orderly, succorant, and endurant, would perform better on computer assisted instruction. Also, more autonomous students would perform better on programmed texts than computer assisted instruction. Both hypotheses were rejected. The conclusion, based on the interviews, indicated that students performed better on the mode of instruction which fulfilled the particular needs of their personality.

A study which tended to contribute to both criticisms and recommendations previously discussed was Mittler, et al, (1972). It investigated the changing community college scene, where the educators were attempting to question their institutional purposes, objectives and roles at various levels, and recognize human potential, then, respond to those needs (pp. 1-2). The study recognized the "extrinsic" needs of students to complete courses for a degree whereby a job was the goal. They would also become productive members of society. This was essential. However, an "intrinsic" need was realized in that each individual should realize his or her full potential as a human being.

Mittler states that "Traditional styles of education are unable to realize this intrinsic goal because so many elements inherent in it ignore, deny, or destroy individuality." (p. 2) Her objections were four: (1) a standardized course content, (2) a semester system geared to a same rate-of-learning for all, (3) a same credit system, and (4) a lectures system geared to the average student. Her conclusion that traditional education appeared devisive rather than unifying for the total person (p. 3), while, "The community college is more pliant, more easily adaptable to the types of innovative programs that are needed." (p. 4)

To gain a knowledge of what is meant by innovative, pliant and adaptable educational technologies, one should read Jamison, et al, (1974, pp. 4-60) for a review of each form of instruction from traditional classroom instruction, instructional television, programmed instruction to other teaching technologies. This study used each mode of instruction and summarized a conclusion on the effectiveness of each mode.

The major conclusion on all forms of instruction, after an extensive survey of research on the effectiveness of the different forms, were (1) that students learn effectively from all these media, and relatively few studies indicated a significant difference in one medium over another (p. 55), (2) Programmed Instruction and Computer-Assisted Instruction, or any other forms of individualization of instruction do not dominate in a rank order of success, one superior to another, in student achievement.

Finally, Jamison, et al, concluded that there has been widespread disillusionment with where educational technology stands today. Research has shown that no significant difference between mode of instruction exists, while researchers in the area had hoped for affirmative results to prove superiority

over traditional methods (p. 57). Those researchers missed the point, in some cases, as they were disappointed in their results and forgot that an alternative, just as good as traditional instruction, was affirmed in most cases. Walker and Schaffarzick (1974) expressed this error in a clear, concise and cogent appraisal:

> "We begin as people always begin, naively, to look for signs of superiority of innovative curricula over traditional curricula. What we found was not superiority, but parity: ... Although this result is disappointing to those of us who had hoped to find a royal road to learning superior to the footpaths we have heretofore been forced to use, it contains a ray of hope." (pp. 108-109)

The study concluded that "If we are to take advantage of this tool (types of curricula), we will need to devise a better system for curriculum policy-making." (p. 109) Two major conclusions have been implied in this Major Research Project. (1) It was not necessary to prove superiority of one mode of instruction or type of learning environment over another to find significant reason for the research carried out. Conversely, parity is as significant as the alternative approaches to the traditional system. (2) The major problem facing change in the community colleges to a more innovative instructional environment will be found in the policy making area of the educational system. (pp. 96-97)

To justify the change, one only needs to establish parity, not superiority of teaching technologies and curricula. Schaumburg (1972) compared students (N=30, N=30) in traditional and individual learning environments and found no significant difference in performance. However, more students (10.6 percent) earned credit for the course in individualized instruction than did the other traditional group. This study is but one introductory study in a long list of studies which will follow to review the work done in the field of education on the very controversial issue of superiority-inferiority of the innovative modes of instruction and curricula.

This controversy has not been, and will not be resolved in this research project. The following pages were only produced to contribute a minute qualitative set of data and results to help in an on-going process of research trial and error methodologies.

Newsom, et al (1972) attempted to investigate an area beyond methodologies as the emphasis was on more than the "laws of learning." The review dealt with the lack of attention to individual differences. It postulates the problem that individual differences among learners are extremely complex and diverse in nature. The emphasis was on learner characteristics more than learning laws.

This will be one of the directions this literature review will subsequently follow. These various studies indicate an emphasis upon the learner characteristics as well as instructional methodologies essential in attempting answers to the questions proposed in the introductory area (p. 5).

Summary of the Literature

A summary of the literature and research would indicate these conclusions: (1) There are no superior-inferior learning methodologies. Most studies which compared traditional instruction with multi-forms of independent-individualized instruction came up with a parity or no significant differences between the two groups; (2) Learners could learn by several different methods equally well, and should be given a choice; (3) Students found the innovative learning environment more anxiety-producing and less effective until they had time to adjust to the 'new' approach. Then, they were better able to meet performance objectives or goals of the subject matter.

In the areas of personality factors and learning environments, studies (1) were less definitive. The researchers were less than successful in attempts to correlate personality factors and performance concretely, or any significant differences with the several modes of instruction (2) Some

environmental factors were more productive (student choice of mode of instruction(, while most factors supported no significant correlations. (3) Many doors were opened to much needed research in the area of: what student matched with what type (mode) of instruction? (4) The lock-step traditional instruction methods will be difficult to modify where students have alternative choices of modes of instruction. And every study has contributed necessary data on the area which will help bring about change in the community colleges in the future.

In a final category, a conclusion on the types of curricula offered in the Independent-Individualized Instruction studies were weighted toward Behavioral sciences, Mathematics, English, and some Natural sciences. This researcher found several areas where a paucity of innovative work was being done or attempted (Economics, Humanities, and Political Sciences). This elicited two responses: (1) Did the researcher miss a representative selection of literature in the fields, or (2) Has the research been limited to a few disciplines, curricula or subject-matter areas?

CHAPTER III

RESULTS OF THE STUDY

The research design consisted of five major hypotheses that were tested. The results have been set forth in five specific task areas with task number five having four parts.

Traditional vs. Individualized Instruction

1. The first task tested the superiority-inferiority of both traditional and independent-individualized methods of instruction. The data (Table 1, p.60) indicated the pretest scores for both groups X_1 and X_2 (X_1 = Traditional instruction group; X_2 = Individualized instruction group). A 't' test for two independent means was run and the 't' score .36 (see Figure 1) at the $<.05$ level indicated no significant difference between group X_1 and group X_2 mean scores. Therefore, it was concluded the two groups were similar in composition as to their knowledge of sociology.

The results of the two methods of instruction was ascertained by running a mean, standard deviation and a 't' Test for Related Measures on the two groups (see Table 1 and Figure 1). Since the 't' value .46 at the $<.05$ level with a df of 30 was not significant, it was concluded that the experimental group (X_2) and the control group (X_1) showed no significant

differences in performance in relationship to the teaching methodologies.

The conclusion was that the null hypothesis was sustained and both teaching methodologies are of equal value in the learning environments.

Figure 1. Individualized vs. Traditional Instruction

Pretest Scores	$\bar{X}$	sd.	df	p.	t
Group X_1	55.37	7.43			
Group X_2	56.60	7.70	58	$<.05$	0.36
Posttest					
Group X_1	29.70	8.78			
Group X_2	28.36	13.22	30	$<.05$	0.46

TABLE I

PRETEST AND POSTTEST SCORES FOR TRADITIONAL AND INDIVIDUALIZED INSTRUCTION

Subjects	X_1 Pre-Test	Post-Test	Gain	X_2 Pre-Test	Post-Test	Gain
S1	59	99	40	63	82	19
S2	56	82	26	54	93	29
S3	49	70	21	60	92	32
S4	33	96	43	63	97	34
S5	69	85	16	60	88	28
S6	39	92	53	53	96	43
S7	63	70	7	42	85	37
S8	66	81	15	39	83	44
S9	46	71	25	49	88	39
S10	63	92	29	46	85	39
S11	66	92	26	59	86	27
S12	39	93	54	53	80	27
S13	56	73	17	63	96	33
S14	56	66	10	56	82	26
S15	49	99	50	46	85	39
S16	59	66	7	53	93	40
S17	56	76	20	60	82	22
S18	56	92	36	46	88	42
S19	46	80	34	56	80	24
S20	46	80	34	63	92	29
S21	63	85	22	66	90	24
S22	53	82	29	56	70	14
S23	56	85	29	60	82	22
S24	53	96	43	69	95	26
S25	53	76	23	63	92	29
S26	56	82	26	66	85	19
S27	46	80	34	66	82	16
S28	60	92	32	56	82	26
S29	56	99	43	49	92	43
S30	73	80	7	63	82	19
TOTALS:	1661	2512	849	1698	2605	916

Student Attitudes Toward Traditional or Independent Instruction

2. The second task was a measurement of student attitudes toward individualized instruction according to rank and sex (Male X_1, Female X_2, Freshman X_3, Sophomore X_4). The design involved four groups of twenty students in each group (X_1=20, X_2=20, X_3=20, X_4=20) for a total randomly selected population of eighty students from a population sample of 300 students (see Table 2, p.62).

A mean score, a standard deviation and a combination of 't' Tests were run on the four groups (see Figure 2). The results sustained the null hypothesis (Number 2) that no significant differences would be found, or that students would accept traditional instruction and individualized instruction equally from an attitudinal perspective.

Figure 2. Student Attitudes Toward Traditional and Individualized Forms of Instruction: 't' Table

	$\bar{X}$	sd.	df	p.	"t"(X_2	X_3	X_4)
Group X_1	3.3875	.8211	20	$<.05$	.144	.186	1.154
Group X_2	3.4250	.8236	20	$<.05$	--	.298	1.104
Group X_3	3.3250	1.2568	20	$<.05$	--	--	1.089
Group X_4	3.7000	.8907	20	$<.05$	--	--	--

TABLE 2

ATTITUDINAL SCORES FOR STUDENTS' ACCEPTANCE/REJECTION OF TRADITIONAL-INDIVIDUALIZED STUDIES

	X_1 Male	X_2 Female	X_3 Freshman	X_4 Sophomore
S1	2.50	3.25	1.00	3.75
S2	1.25	4.50	4.00	4.50
S3	3.00	2.75	4.50	4.50
S4	2.00	2.25	4.00	4.25
S5	4.50	4.50	4.50	4.25
S6	4.25	3.50	4.75	4.00
S7	3.75	3.75	4.50	4.00
S8	3.25	2.50	2.00	3.75
S9	4.50	4.50	3.00	1.75
S10	3.50	2.75	4.00	4.75
S11	3.50	4.00	3.75	2.00
S12	3.50	3.50	4.25	4.00
S13	4.25	2.50	1.00	3.75
S14	3.50	3.25	3.50	4.50
S15	2.25	3.25	4.00	2.75
S16	3.00	2.50	1.75	4.50
S17	2.75	4.50	3.75	3.50
S18	4.00	2.25	3.75	4.25
S19	1.75	4.50	1.00	3.00
S20	3.75	4.00	3.50	2.25
$\bar{M}$ =	3.3875	3.4250	3.3250	3.7000

Independent Study Results (age and educational level)

3. The third task was a study of 105 students who participated in a television course in Ecology in the Summer of 1974. This was an independent instruction course with a student-centered instructor-student relationship (see Table 3, p.64).

Age:

The hypothesis of no difference in mean scores of students according to age was sustained. An Analysis of Variance was run on the three groups (A_1, A_2, A_3) mean scores. Since the F value of 0.0012 at the <.05 level with df of 2 and 57 would occur by chance less than once in a thousand times, it was concluded that age was no factor in independent study success or failure (see Figure 3).

Figure 3. Analysis of Variance - Age

	$\bar{X}$	sd.	N.
A_1 = under 21 yrs. of age	78.9	7.4332	20
A_2 = under 30 yrs. of age	79.6	16.5542	20
A_3 = over 31 yrs. of age	86.45	7.0373	20

Source	SS	df	MS	F	p.
Total	154874.5	59			
Between Groups	4.9	2	4.9	.0012	<.05
Within Groups	154869.6	57	4075.5		

TABLE 3

INDEPENDENT STUDY SCORES ACCORDING TO AGE OF STUDENTS

	A-1 Under 21 Yrs.	A-2 22-30 Yrs.	A-3 31-60 Yrs.
S1	86	26	86
S2	78	82	87
S3	77	76	85
S4	79	89	90
S5	78	61	87
S6	67	56	78
S7	73	68	90
S8	64	81	88
S9	73	88	74
S10	85	83	94
S11	79	89	90
S12	88	94	98
S13	73	93	83
S14	88	79	92
S15	90	89	95
S16	73	95	75
S17	76	76	90
S18	78	90	77
S19	82	92	77
S20	91	85	93

Educational Level:

In the second part of this task, the null hypothesis was rejected. The results of the Analysis of Variance run on the same 105 students according to educational rank (Freshman, Sophomore, Undergraduate or Graduate degree) was more productive in that there were differences in performance on posttests according to educational levels. Group B_1 performed lower than groups B_2 and B_3 (see both Table 4, p.67 and Figure 4, p.66).

Since the *F* value of 8.1785 at the $< .05$ level with a *df* of 2 and 57 was greater than the critical *F* distribution value of 5.80, it was concluded that educational level was a significant factor in an independent study learning environment.

A critical '*t*' Test was run on the three groups - B_1, B_2, and B_3, with a significant difference between B_1 (Freshman) and B_2 (Sophomore) and between B_1 (Freshman) and B_3 (Undergraduate degrees and Graduate level). The '*t*' scores, both B_2 - 2.9530 and B_3 - 3.5330, were significant at the $< .05$ level with a *df* of 20 (see Figure 4). This would indicate Sophomores and Undergraduate-Graduate degree holders would perform better than Freshmen in an independent-type learning environment.

Figure 4. Analysis of Variance: Educational Level

	$\bar{X}$	sd.	N.
Group B_1	77.8	9.4457	20
Group B_2	85.2	6.2962	20
Group B_3	86.7	6.1396	20

Source	SS	df	MS	F	p.
Total	4072.7333	59			
Between groups	908.1333	2	454.0667	8.1785	<.05
Within groups	3164.6000	57	55.5193		

t Table for F Value

	B_1	B_2	B_3
B_1	--	2.953	3.5330
B_2	--	--	.7628
B_3	--	--	--

TABLE 4

INDEPENDENT STUDY SCORES OF STUDENTS ACCORDING TO EDUCATIONAL LEVEL-RANK

	Freshman-B_1	Sophomore-B_2	BA or Masters Degree-B_3
S1	68	82	95
S2	61	89	86
S3	68	88	75
S4	81	83	90
S5	92	89	92
S6	88	93	90
S7	84	89	87
S8	86	90	78
S9	91	76	90
S10	82	87	85
S11	78	98	94
S12	73	92	79
S13	88	84	95
S14	73	79	85
S15	88	76	74
S16	73	90	89
S17	64	79	90
S18	73	85	86
S19	67	77	85
S20	78	78	89

4. The fifth hypothesis of no correlation between grade-point average, achievement, autonomy, and endurance, and posttest scores on individualized instruction for 50 students was sustained for autonomy, and endurance correlations with posttest scores. However, it was rejected for gradepoint average and achievement scores correlation with posttest scores in an individualized instruction unit in Sociology.

Gradepoint Average

A. The Pearson Product-Moment Correlation Analysis was used to test 50 student gradepoint averages with posttest scores (see Table 5, p.87). The *r* value for the test was 0.2790. The critical value for Pearson's *r* correlation coefficient at the $< .05$ level with *df* of 50 was 0.2732. Therefore, it was concluded a correlation existed between gradepoint averages - posttest scores. A critical '*t*' Test was run on the *r* with a result that the '*t*' value 2.014 was higher than the critical value at the $< .05$ level with a *df* of 48 which was 2.000. This test sustained the results that a significant difference was found in the *r* value.

Achievement Scores

B. The next correlation was run, using the Spearman Rank-Order Correlation test on achievement-posttest scores

(see Table 6, p.89). The data resulted in a rejection of the null hypothesis. Since the critical r value for 50 students was 0.367 at the <.05 level with a df of 50, it was concluded that there was a positive correlation between achievement scores and posttest scores in individualized instruction in sociology.

Autonomy Scores

C. In the next stage of this task, the Spearman-Rank-Order Correlation test was run on autonomy - posttest scores (see Table 7, p.90). The results of the r value was 0.191 for 50 students at the <.05 level with a df of 50. The null hypothesis was sustained. It was concluded that no significant correlation between autonomy scores and posttest scores in individualized instruction in sociology existed.

Endurance Scores

D. The final test was run on endurance - posttest scores and the null hypothesis of no significant correlation between the two variables existed. The r value for the 50 students in individualized instruction was - 0.087 at the <.05 level with a df of 50 (see Table 8, p.91).

CHAPTER IV

CONCLUSIONS & RECOMMENDATIONS

The purpose of this study was to set forth a set of criteria which would help students in making a choice of learning environments prior to entry into a specific course or discipline.

The questions researched were to establish who would/or would not benefit from independent-individualized approaches to the learning process, and who should/or should not enter the specific learning environments.

First, the study was carried out to collect more empirical tested results on the difference, or no difference, between either traditional classroom approaches and independent-individually oriented approaches. There have been sufficient studies (see Chapter II) as well as this work's findings to make these individual-centered approaches just as acceptable as learning technologies in the traditionally oriented classroom approaches. Both the literature and this study indicated that there were no significant differences between the two types of learning environment.

The claim for the Individualized Instruction approach was not one of superiority over the traditional approach, but one of being just as productive as in the traditional approach learning environment.

Second, student attitudes toward all forms of independent vs. traditional forms of instruction were equally divided. It did indicate two things: (1) students would not opt out for one or the other method, en masse, (2) and students would possibly experience higher motivation in a course where a choice was possible in types of learning environments available to students.

If there was no significant difference between the two forms of group centered and individual centered learning environments as to student performance, and this was established in the literature search and the first task of this work, the student should have a <u>right</u> to a choice of modes of learning. The studies cited in Chapter Two indicated this need for student choice, as well.

The <u>first</u> criterion suggested from this area of the study would be the right of the student to make his/or her own choice of learning environments.

Third, the age of the students had no significant effect upon learning in an independent environment. This suggested that age would be no barrier to a student's choice of a learning environment. However, the second part of the study indicated that sophomore and 'upper level' students performed significantly better than freshmen in an independent environment. This would make a positive conclusion that possible upper division courses would be an area for this type of instructional environment.

These findings would conflict with some university (University of Tennessee at Knoxville) and college (Greenville Technical College, South Carolina) practices which are extensively using independent studies at lower levels. More study in this area will be needed as evidences are less than adequate in this research area. Yet, one could make a case for sophomore or higher rank as a second criterion for entrance into an independent-individualized learning environment.

Fourth, the attempted research using gradepoint average and posttest scores from a unit in sociology affirmed this was an essential criterion in a student choice of a learning environment. The study indicated a positive correlation between the two variables, and this confirmed what others (Chapter II)

had found that higher gradepoint averages resulted in higher performance scores in individualized instruction. Therefore, a third criterion for entrance into independent-individualized instructional environments should be higher gradepoint averages.

A caution must be inserted here. This does not refer to developmental studies for high-risk students who are not in the regular college programs, and have an environmental setting which Roueche and Wade, et al, have discussed extensively in their works.

Fifth, the area of achievement scores and posttest scores from a unit in sociology had a high correlation between high achievement scores and highly successful posttest scores indicated a fourth criterion for helping the student and other persons involved in his decision to enter either traditional or independent learning environments. This correlation between achievement (high) scores and success in the unit (high) scores would be the most difficult to ascertain by students. The students would have to have, at least in one area, the Edwards' Personality Preference Schedule administered prior to registration to obtain this score. Other methods of obtaining this datum would be highly desirable.

The purpose of this Major Research Project was to test areas that would assist the researcher in developing a set of criteria for student choice of instructional modes or environments. This has been done in that the following four criteria have been suggested as standards for the formulation of a college policy. These four criteria could be used by college "decision-makers" in setting forth guidelines to assist students in making a judgment as to the types of learning environment they choose.

1. Students should have the privilege of choice of either traditional or independent learning environments.
2. Students advanced beyond the freshman level in college would have a better chance for success in the independent environment.
3. Students with high gradepoint averages would probably be more successful in an independent environment than students with a middle or low gradepoint average.
4. Students with high achievement need scores would probably be more successful in the independent environment than students with low-middle achievement need scores.

In conclusion, the researcher recommends that the community college build in the findings of this study into its program-course registration structures whereby students would have a choice in course schedules to elect to go traditional or independent in most course-offerings.

First, when the schedule of course-offerings for the year-semester-quarter are made up, a certain number of sections of all courses be designated as independent-individualized courses which do not change time sequence (eg., the hour - day of meeting) but does alter the instructor-group centered approach and the time required to complete the course, per se.

Second, through the Bulletin, and counseling, assist students to make educated selections of courses according to the four criteria set forth in this study. Space in the Bulletin could be provided for these criteria and a brief description of the requirements in the two different types of learning environments.

CHAPTER V

SIGNIFICANCE OF THE STUDY

This study was oriented toward the heterogeneous student population of the community college, per se. It was not oriented toward the high-risk developmental program students. Therefore, the study has significance for regular college courses and program curricula.

From a positive approach to the study's contribution to the research in the field, it produced no earth-shaking new evidence. It did give more data on who would or would not benefit from individualized instructional modes of learning. Also, it contributed criteria which would help the regular student in making his decisions as to which direction he follows in his learning experiences.

The study gave more statistical evidences that individual forms of instruction were co-equal with traditional forms. A superior-inferior status finding was not necessary or important. The research sought to obtain statistical data and not a pre-judged conclusion on superior-inferior types of instruction.

In the area of personality factors, except in the area of achievement, no new evidence was found in this study. This area has proven to be the most illusive and least productive for research which indicates either a futility in continuing down this road, or a need to intensify research in the area of personality factors. Literature in the field has not been too productive in the past. Nevertheless, the potential for productive research in this area is almost unlimited.

The last area of the types of learning environments has been somewhat more productive. More research in this area is needed and holds promise of a higher success rate in prediction of what type for what student. However, the two - personality factors and learning environments - areas would necessarily compliment each other in the predictability of student success, per se.

In conclusion, the most significant implication for this study was establishing four criteria by which administrators can incorporate into college policy. This will give administrators a basis for judgment in the formulation of policy for multi-learning environments. The four criteria should be adopted and used as standards or guidelines to help students, counselors and administrators make adequate choices as to learning environments.

The researcher has attempted to bring about change in the college scheduling policy, whereby experimental scheduling of several discipline or course area - behavioral sciences and/or natural sciences - could break the barrier of traditional learning environments and help bring about some courses designated as independent-individualized courses.

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APPENDIX

QUESTIONNAIRE ON INDIVIDUALIZED INSTRUCTION

Purpose: To test student responses/attitudes toward Independent-Individualized instruction in contrast to traditional teaching methods and classroom structure.

Instructions:
Use a scale from 1 to 5 to record your response to each of the ten questions. Please respond to all questions.

Scale:
1 = Extreme Negative Response
2 = Negative Response
3 = No Response
4 = Positive Response
5 = Extremely Positive Response

_____ 1. Individualized instruction is superior to the lecture method.

_____ 2. Individualized instruction is superior to class discussion, reports, et cetera.

_____ 3. The change from a highly structured, rigid classroom environment to a more liberal self-pacing environment is excellent.

_____ 4. Individualized instruction is exciting and produces a better student response to the subject-matter.

_____ 5. Individualized instruction gives the student time to work at his own pace.

_____ 6. Individualized instruction is interesting, and increases student motivation.

_____ 7. Individualized instruction is O.K.!

_____ 8. Individualized instruction is a superior teaching method to the traditional methods in the traditional classroom.

_____ 9. The method and way of testing student progress toward mastery of the material in this Independent method is superior to traditional form of tests.

_____ 10. The freedom the student has in meeting the requirements for a course is superior to the traditional model of the classroom demands.

Please fill in numbers 1 and 2 below. Circle (a), (b), or (c) in number 3:

1. Age_____

2. Sex_____

3. Rank: (a)Freshman; (b)Sophomore; (c)Other

TABLE 5

GPA AND POSTTEST SCORES FOR INDIVIDUALIZED STUDY USING INDIVIDUALIZED LEARNING SYSTEMS CURRICULUM

	Posttest	G.P.A.
S1	82.5	3.60
S2	90.0	3.50
S3	82.5	3.90
S4	82.5	3.33
S5	87.5	3.87
S6	87.5	3.00
S7	48.5	3.10
S8	85.0	2.50
S9	45.0	2.52
S10	82.5	3.30
S11	72.5	3.50
S12	87.5	3.71
S13	67.5	3.00
S14	57.5	2.75
S15	40.0	2.56
S16	90.0	3.47
S17	87.5	2.74
S18	80.0	3.00
S19	75.0	4.00
S20	80.0	3.20
S21	72.5	3.00
S22	40.0	3.40
S23	85.0	3.00
S24	80.0	2.85
S25	80.0	3.00

TABLE 5 CONTINUED

GPA AND POSTTEST SCORES FOR INDIVIDUALIZED STUDY
USING INDIVIDUALIZED LEARNING SYSTEMS CURRICULUM

	Posttest	G.P.A.
S26	72.5	2.80
S27	50.0	2.30
S28	82.5	2.25
S29	67.5	3.40
S30	75.0	2.50
S31	60.0	4.00
S32	50.0	3.50
S33	85.0	3.20
S34	77.5	2.50
S35	72.5	3.00
S36	90.0	4.00
S37	45.0	3.30
S38	85.0	3.25
S39	65.0	3.00
S40	72.5	2.60
S41	95.0	3.30
S42	85.0	3.30
S43	85.0	2.80
S44	62.5	2.34
S45	92.5	3.85
S46	55.0	3.00
S47	72.5	2.50
S48	70.0	3.00
S49	85.0	3.50
S50	80.0	3.40

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TABLE 6

POSTTEST SCORES AND ACHIEVEMENT SCORES RANK-ORDER - SPEARMAN RANK ORDER

1	82.50	58.00	31	38
2	90.00	72.00	48	44
3	82.50	40.00	32	27
4	82.50	22.00	34	17
5	87.50	50.00	42	34
6	87.50	36.00	44	24
7	48.50	3.00	5	1
8	45.00	7.00	4	3
9	82.50	36.00	33	22
10	72.50	64.00	16	42
11	87.50	36.00	45	23
12	67.50	7.00	14	4
13	57.50	27.00	9	20
14	40.00	84.00	1	47
15	90.00	8.00	46	6
16	87.50	22.00	43	16
17	80.00	47.00	25	29
18	75.00	58.00	23	36
19	60.00	22.00	29	18
20	72.50	64.00	17	41
21	40.00	27.00	2	19
22	85.00	50.00	40	32
23	80.00	8.00	27	5
24	80.00	60.00	28	40
25	72.50	6.00	19	2
26	50.00	16.00	7	13
27	82.50	37.00	30	25
28	67.50	50.00	13	31
29	75.00	21.00	22	14
30	60.00	9.00	10	8
31	50.00	15.00	6	11
32	85.00	65.00	38	43
33	77.50	99.00	24	50
34	72.50	21.00	18	15
35	90.00	77.00	47	45
36	45.00	30.00	3	21
37	85.00	60.00	37	39
38	65.00	9.00	12	7
39	72.50	86.00	21	48
40	95.00	77.00	50	46
41	85.00	47.00	39	30
42	85.00	58.00	36	37
43	62.50	15.00	11	12
44	92.50	38.00	49	26
45	55.00	10.00	8	10
46	72.50	46.00	20	28
47	70.00	50.00	15	33
48	85.00	99.00	35	49
49	80.00	58.00	26	35
50	85.00	10.00	41	9

TABLE 7

POSTTEST AND AUTONOMY SCORES RANK-ORDER - SPEARMAN RANK ORDER

1	82.50	62.00	31	34
2	90.00	92.00	48	48
3	82.50	28.00	32	12
4	82.50	52.00	34	31
5	87.50	11.00	42	5
6	87.50	36.00	44	20
7	48.50	20.00	5	10
8	45.00	61.00	4	33
9	82.50	53.00	33	32
10	72.50	87.00	16	46
11	87.50	97.00	45	50
12	67.50	52.00	14	30
13	57.50	28.00	9	13
14	40.00	9.00	1	4
15	90.00	36.00	46	22
16	87.50	82.00	43	42
17	80.00	36.00	25	19
18	75.00	62.00	23	35
19	80.00	6.00	29	2
20	72.50	36.00	17	24
21	40.00	36.00	2	18
22	85.00	79.00	40	40
23	80.00	97.00	27	49
24	80.00	72.00	28	39
25	72.50	21.00	19	11
26	50.00	82.00	7	41
27	82.50	15.00	30	8
28	67.50	64.00	13	37
29	75.00	29.00	22	16
30	60.00	45.00	10	27
31	50.00	28.00	6	14
32	85.00	29.00	38	15
33	77.50	64.00	24	36
34	72.50	45.00	18	25
35	90.00	89.00	47	47
36	45.00	8.00	3	3
37	85.00	64.00	37	38
38	65.00	36.00	12	23
39	72.50	15.00	21	7
40	95.00	1.00	50	1
41	85.00	87.00	39	45
42	85.00	87.00	36	44
43	62.50	45.00	11	26
44	92.50	36.00	49	21
45	55.00	34.00	8	17
46	72.50	84.00	20	43
47	70.00	45.00	15	28
48	85.00	20.00	35	9
49	80.00	45.00	26	29
50	85.00	15.00	41	6

TABLE 8

POSTTEST AND ENDURANCE SCORES RANK-ORDER - SPEARMAN RANK ORDER

1	82.50	18.00	31	14
2	90.00	30.00	48	27
3	82.50	11.00	32	9
4	82.50	1.00	34	1
5	87.50	69.00	42	43
6	87.50	18.00	44	17
7	48.50	69.00	5	41
8	45.00	18.00	4	20
9	82.50	63.00	33	39
10	72.50	50.00	16	36
11	87.50	9.00	45	8
12	67.50	75.00	14	46
13	57.50	50.00	9	34
14	40.00	95.00	1	50
15	90.00	36.00	46	29
16	87.50	18.00	43	15
17	80.00	69.00	25	44
18	75.00	44.00	23	31
19	80.00	36.00	29	30
20	72.50	57.00	17	38
21	40.00	69.00	2	42
22	85.00	56.00	40	37
23	80.00	18.00	27	16
24	80.00	32.00	28	28
25	72.50	7.00	19	5
26	50.00	18.00	7	19
27	82.50	18.00	30	18
28	67.50	72.00	13	45
29	75.00	23.00	22	23
30	60.00	9.00	10	7
31	50.00	15.00	6	13
32	85.00	7.00	38	6
33	77.50	15.00	24	11
34	72.50	20.00	18	22
35	90.00	11.00	47	10
36	45.00	47.00	3	32
37	85.00	79.00	37	47
38	65.00	5.00	12	2
39	72.50	67.00	21	40
40	95.00	7.00	50	3
41	85.00	24.00	39	24
42	85.00	50.00	36	35
43	62.50	15.00	11	12
44	92.50	47.00	49	33
45	55.00	24.00	8	25
46	72.50	7.00	20	4
47	70.00	20.00	15	21
48	85.00	95.00	35	49
49	80.00	30.00	26	26
50	80.00	30.00	26	26